

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application No. 09/449,912

Applicant: Divittorio

Filed: December 2, 1999

TC/AU: 2195

Examiner: Kenneth Tang

Docket No.: 202232 (Client Reference No. 99,032)

Customer No.: 23460

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Sir:

Applicant requests review of the non-final rejection (after a previous Final rejection), dated October 6, 2006, in the above-identified application. No amendments are being filed with this request. This request is being filed with a notice of appeal. An appeal brief has not yet been filed. This Pre-Appeal Brief Request For Review is submitted for the reason(s) stated on the attached sheets. An appendix containing the set of presently pending claims is attached for your convenience.

Applicant traverses the rejection of the pending claims. In an effort to minimize the issues addressed during this review, Applicant has focused primarily upon claim 1. However, Applicant also requests consideration of the other rejected claims as well, including certain dependent claims for which the Office Action does not identify at least one recited element in the prior art. Applicant requests pre-appeal brief review of the rejection of at least claim 1 because the rejection does not show proper motivation to modify Applicant's admitted prior to render the control processor execution scheme recited in claim 1. Nowhere do the cited references disclose or suggest the presently claimed process controller and method wherein an embedded application program that calculates set point values for the control processor is executed on the process controller at a lower assigned priority than a set of control blocks. For at least this reason, the presently pending claims are patentable over the prior art presently known to Applicant.

Applicant's Representative Pending Claim 1

1. A control processor for executing a set of control tasks defining dynamic model-based interactive control of an industrial process, the control processor comprising:
 - an embedded control task-comprising a multivariable linear program including a set of output values corresponding to process setpoints; and
 - a set of control blocks including regulatory control blocks having output values that are transmitted by the control processor to field devices coupled to the industrial process, wherein the embedded control task executes at a lower execution priority than an execution priority of the set of control blocks.

Reasons for Pre-Appeal Brief Request For Review

Applicant traverses the rejection of the pending claims because the Office Action does not present a *prima facie* case of obviousness. The most significant error is a complete absence of any teaching of motivation in the prior art to incorporate the embedded control task into a control processor, and execute the embedded control task at a lower priority than the set of control blocks. Applicant, in the appeal brief, intends to address an absence of motivation to modify AAPA in view of Sinibaldi et al. to render Applicant's invention. However, a fundamental error in the Office Action renders this analysis unnecessary. In particular, Sinibaldi's "Matrix" described at page 18 refers to a "table" (i.e., an array) in

memory. Nowhere does Sinibaldi disclose that the contents of the table are generated from a multivariable linear program. It necessarily follows that Sinibaldi does not disclose that the multivariable linear program operates at a lower execution priority than an execution priority of a set of control blocks.

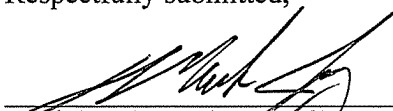
Furthermore, the Office Action has still not identified the recited elements of claims 8-12 and 20-24. Notwithstanding Applicant's specific previous requests, the Office Action continues to reject claims 8-12 and 20-24 without identifying the recited elements in the prior art reference. Applicant specifically requests reconsideration of at least the rejection of claims 8, 9, 11, 12, 20, 21, 23 and 24 in view of Applicant's previous remarks at page 13 of the September 20, 2005 response.

Conclusion

The Office Action has not set forth a *prima facie* case of obviousness for the rejection of the claims. Applicant submits that the prior art neither discloses nor suggests modifying AAPA to render the claimed multi-level control task execution scheme wherein an embedded multi-variable linear program, that provides setpoints for an industrial process, executes on a control processor at a lower execution priority level than a set of control blocks.

For this and other reasons submitted herein above, expedited review is requested to remedy clear errors in the Office Action's rejection of the pending claims.

Respectfully submitted,



Mark Joy, Reg. No. 35,562
LEYDIG, VOIT & MAYER, LTD.
Two Prudential Plaza, Suite 4900
180 North Stetson Avenue
Chicago, Illinois 60601-6780
(312) 616-5600 (telephone)
(312) 616-5700 (facsimile)

Date: April 6, 2006

Appealed Claims Appendix

1. (Previously presented) A control processor for executing a set of control tasks defining dynamic model-based interactive control of an industrial process, the control processor comprising:

an embedded control task comprising a multivariable linear program including a set of output values corresponding to process setpoints; and

a set of control blocks including regulatory control blocks having output values that are transmitted by the control processor to field devices coupled to the industrial process, wherein the embedded control task executes at a lower execution priority than an execution priority of the set of control blocks.

2. (Original) The control processor of claim 1 wherein the set of control blocks comprise supervisory control blocks.

3. (Original) The control processor of claim 2 wherein the supervisory control blocks include a multivariable control block including computer instructions facilitating communication of data between the control processor and a workstation.

4. (Original) The control processor of claim 3 wherein the multivariable control block includes computer instructions for receiving and storing a process control model to be implemented by the embedded control task.

5. (Original) The control processor of claim 2 wherein the supervisory control blocks include at least one multivariable loop block including computer instructions for providing an input value for a regulatory control block.

6. (Currently amended) The control processor of claim 5 wherein the regulatory control block is a proportional-integral-derivative block.

7. (Original) The control processor of claim 5 wherein the regulatory control block is a ratio block.

8. (Previously presented) The control processor of claim 1 further comprising a repetition cycle parameter specifying a period for re-commencing a cycle of the embedded control task.

9. (Original) The control processor of claim 8 wherein the set of control blocks includes a supervisory control block including a sequence of instructions to determine when to re-commence a cycle of the embedded task in accordance with a value specified by the repetition cycle parameter.

10. (Original) The control processor of claim 1 further comprising a block processing cycle parameter specifying a repetition period for re-commencing a cycle of executing the set of control blocks.

11. (Original) The control processor of claim 10 further comprising a repetition cycle parameter specifying a period for re-commencing a cycle of executing the embedded control task.

12. (Original) The control processor of claim 11 wherein a period specified by the repetition cycle parameter exceeds a period specified by the block processing cycle parameter.

13. (Previously presented) A method for operating a control processor, in an industrial process control environment, to establish operating values including a set of setpoint values and a set of process control variables associated with control elements in a controlled industrial process based upon a set of input variables including process variables provided to the control processor and representing the present state of the controlled industrial process, the method comprising the steps of:

executing, by the control processor, an embedded multivariable control application including computer instructions facilitating computing a setpoint value corresponding to a process control variable; and

executing, by the control processor, a set of control blocks including regulatory control blocks for receiving and storing a set of process variables representing the present state of a controlled process, wherein the embedded multivariable control application executes at a lower execution priority than an execution priority of the set of control blocks.

14. (Original) The method of claim 13 wherein the set of control blocks comprise supervisory control blocks.

15. (Original) The method of claim 14 wherein the supervisory control blocks include a multivariable control block and further including the step of downloading data from a workstation to a database accessed by the multivariable control block.

16. (Original) The method of claim 15 further comprising the steps of receiving and storing, within the database accessed by the multivariable control block, a process control model to be implemented by the embedded multivariable control application.

17. (Original) The method of claim 14 wherein the supervisory control blocks include at least one multivariable loop block, and further comprising the step of providing an input value for a regulatory control block in accordance with execution of instructions and data associated with the at least one multivariable loop block.

18. (Previously presented) The method of claim 17 wherein the regulatory control block is a proportional-integral-derivative block.

19. (Original) The method of claim 17 wherein the regulatory control block is a ratio block.

20. (Previously presented) The method of claim 13 further comprising the step of maintaining a repetition cycle parameter specifying a period for re-commencing a cycle of the embedded multivariable control application.

21. (Original) The method of claim 20 wherein the set of control blocks includes a supervisory control block, and further comprising the step of determining, by the supervisory control block, when to re-commence a cycle of the embedded multivariable control application in accordance with a value specified by the repetition cycle parameter.

22. (Original) The method of claim 13 further comprising the step of maintaining a block processing cycle parameter specifying a repetition period for re-commencing a cycle of executing the set of control blocks.

23. (Previously presented) The method of claim 22 further comprising the step of maintaining a repetition cycle parameter specifying a period for re-commencing a cycle of executing the embedded multivariable control application.

24. (Original) The method of claim 23 wherein a period specified by the repetition cycle parameter exceeds a period specified by the block processing cycle parameter.

25. (Previously presented) An industrial process control computer having multiple operating levels including:

- a background control program execution level wherein the process control computer executes an embedded multivariable process control application, the embedded control application including instructions for executing a multivariable linear program to generate a set of values corresponding to process control variable setpoints; and

- a foreground control block execution level wherein the process control computer executes a set of control blocks, at a higher execution priority level than the background control program execution level, the set of control blocks including program instructions that, when executed, receive and store a set of process variable values representing the state of a controlled process.

26. (Previously presented) A multi-level multivariable industrial process control program execution framework for an industrial control processor including:

- a first cyclically executed sequence of instructions, repeatedly executed according to a first configurable repetition period and at a first level of execution priority, the first cyclically executed sequence of instructions including at least a set of instructions for calculating a setpoint value for a process control variable; and

- a second cyclically executed sequence of instructions, repeatedly executed according to a second repetition period and at a second level of execution priority, the second level of execution priority exceeding the first level of execution priority, and thus enabling the control processor to temporarily suspend execution of the first cyclically executed sequence of instructions in order to execute the second cyclically executed sequence of instructions.